

WE CLAIM

1. A method of forming a compound Single Instruction/Multiple Data instruction, said method comprising:
- 5 selecting at least two Single Instruction/Multiple Data operations of a reduced instruction set computing type; and
- combining said at least two Single Instruction/Multiple Data operations to execute in a single instruction cycle to thereby yield the compound Single Instruction/Multiple Data instruction.
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2. The method of claim 1, further comprising:
- evaluating a processing throughput of the compound Single Instruction/Multiple Data instruction; and
- determining a power consumption of the compound Single
- 15 Instruction/Multiple Data instruction.
3. The method of claim 2, further comprising:
- associating an energy consumption value with at least one micro-operation of the compound Single Instruction/Multiple Data instruction;
- 20 and
- minimizing the sum of the energy consumption value.
4. The method of claim 1, wherein the compound Single Instruction/Multiple Data instruction includes a vector add-subtract operation.
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5. The method of claim 1, wherein the compound Single Instruction/Multiple Data instruction includes a vector minimum-difference operation.
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6. The method of claim 1, wherein the compound Single Instruction/Multiple Data instruction includes a vector compare-maximum operation.

7. The method of claim 1, wherein the compound Single Instruction/Multiple Data instruction includes a vector absolute difference and add operation.

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8. The method of claim 1, wherein the compound Single Instruction/Multiple Data instruction includes a vector average operation.

9. The method of claim 1, wherein the compound Single Instruction/Multiple Data instruction includes a vector scale operation.

10. The method of claim 1, wherein the compound Single Instruction/Multiple Data instruction includes conditional operations on elements of a data vector.

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11. The method of claim 10, wherein the compound Single Instruction/Multiple Data instruction includes a vector conditional negate and add operation.

12. The method of claim 10, wherein the compound Single Instruction/Multiple Data instruction includes a vector select and viterbi shift left operation.

13. A method of estimating a relative power consumption of a software algorithm, comprising:
establishing a relative energy database listing a plurality of micro-operations, each micro-operation having an associated relative energy value; and

determining the relative power consumption of the software algorithm incorporating one or more of the micro-operations based on the relative energy values of the incorporated micro-operations.

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14. The method of claim 13, further comprising:
executing the software algorithm on a simulator; and
computing a sum of the relative energy values of the micro-
operations contained in the executed software algorithm.

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15. The method of claim 13, wherein:
at least one of the micro-operations of the software algorithm is
executed on a Single Instruction/Multiple Data processing unit.

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16. A method for estimating the absolute power consumption of a
software algorithm, comprising:
determining a plurality of relative power estimates of instructions
of a microprocessor;

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simulating a software algorithm including one or more
compound instructions; and
determining an absolute power estimate of a software algorithm
to be executed by the microprocessor based on the relative power estimates.

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